

Amendments to the Claims

Please amend Claims 61, 70, and 76 as indicated in the Complete Listing of Claims below:

Complete Listing of Claims

Claims 44-60 (cancelled)

Claim 61 (currently amended) A photonic or phononic lattice structure, comprising:

- (a) a plurality of honeycomb layers stacked one above the other, with each honeycomb layer being formed by depositing and patterning layers of a first material and a second material to form a honeycomb structure from the first material with the remainder of the honeycomb layer comprising the second material, and with adjacent layers of the plurality of honeycomb layers being laterally displaced relative to each other along a diagonal thereof;
- (b) an interconnection layer sandwiched between each pair of adjacent honeycomb layers for interconnecting the adjacent honeycomb layers at vertices thereof, with the interconnection layer being formed by depositing and patterning layers of the first material to form dots wherein the vertices are interconnected, with the remainder of the interconnection layer comprising the second material, wherein the first and the second materials are selected from the group consisting of polycrystalline silicon, amorphous silicon, silicon nitride, silicon dioxide, silicate glasses, III-V semiconductors, II-VI semiconductors, II-IV semiconductors, transparent oxides, sol-gel glasses and spin-on glasses.

Claim 62 (cancelled)

Claim 63 (previously amended) The structure of Claim 61 wherein a third material is substituted for the second material after formation of the plurality of honeycomb layers and each interconnection layer.

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Claim 64 (previously amended) The structure of Claim 61 further comprising a substrate whereon the each honeycomb layer and interconnection layer are supported.

Claim 65 (previously amended) The structure of Claim 61 wherein the honeycomb structure comprises a plurality of interconnected rods, and the thickness of each honeycomb layer is equal to one-quarter of the length of one of the rods.

Claim 66 (original) The structure of Claim 65 wherein the dots are circular in the plane of the interconnection layer.

Claim 67 (original) The structure of Claim 66 wherein the circular dots have a diameter substantially equal to one-half the length of one of the rods.

Claim 68 (previously amended) The structure of Claim 61 wherein the thickness of each interconnection layer is twice the thickness of each honeycomb layer.

Claim 69 (previously amended) The structure of Claim 61 wherein the plurality of honeycomb layers forms a four-layer periodic structure having a bandgap therein.

Claim 70 (currently amended) A photonic or phononic lattice structure comprising a plurality of honeycomb layers formed from interconnected rods, with adjacent honeycomb layers being laterally shifted along a diagonal relative to each other and being connected together through an intervening layer, wherein the plurality of honeycomb layers forms a periodic structure having a bandgap therein, and [wherein] with each rod comprising a [materials] material selected from the group consisting of polycrystalline silicon, amorphous silicon, silicon nitride, silicon dioxide, silicate glasses, III-V semiconductors, II-VI semiconductors, II-IV semiconductors, transparent oxides, sol-gel glasses and spin-on glasses.

Claims 71 - 72 (cancelled)

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Claim 73 (original) The structure of Claim 70 further including a substrate for supporting the plurality of honeycomb layers and each intervening layer.

Claim 74 (original) The structure of Claim 70 wherein the thickness of each honeycomb layer is equal to one-quarter of the length of each rod.

Claim 75 (original) The structure of Claim 70 wherein each intervening layer has a thickness equal to twice the thickness of the honeycomb layers.

Claim 76 (currently amended) A photonic or phononic lattice structure comprising a plurality of stacked hexagonal-pattern layers of interconnected rods separated by intervening interconnection layers having a triangular array of dots formed therein, with adjacent of the hexagonal-pattern layers being laterally displaced relative to each other along a diagonal, and with the dots connecting vertices of the interconnected rods of one hexagonal-pattern layer to the vertices of the interconnected rods of an adjacent hexagonal-pattern layer, [wherein] with the interconnected rods and the dots comprising a first material, [wherein] with a second material filling in spaces between the interconnected rods of each hexagonal-pattern layer and spaces between the dots of each interconnection layer, and [wherein] with the first and the second materials being selected from the group consisting of polycrystalline silicon, amorphous silicon, silicon nitride, silicon dioxide, silicate glasses, III-V semiconductors, II-VI semiconductors, II-IV semiconductors, transparent oxides, sol-gel glasses, spin-on glasses, gases, air and vacuum.

Claims 77 - 79 (cancelled)

Claim 80 (original) The structure of Claim 76 further comprising a substrate whereon the hexagonal-pattern layers and interconnection layers are supported.

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Claim 81 (original) The structure of Claim 76 wherein the thickness of each hexagonal-pattern layer is equal to one-quarter of the length of each rod.

Claim 82 (original) The structure of Claim 81 wherein the thickness of each interconnection layer is twice the thickness of each hexagonal-pattern layer.

Claim 83 (original) The structure of Claim 76 wherein the dots are arranged in a triangular array.